

STORMS AND WEATHER WARNINGS.

EDWARD H. BOWIE, Supervising Forecaster.

WASHINGTON FORECAST DISTRICT.

The month of July was not unlike the month immediately preceding it, in that the eastward trend of weather changes was perceptibly slower than usual for summer months, cyclones were few and of slight intensity and those charted moved across the continent along the Canadian border or well to the northward. The development of the subpermanent high over the North Atlantic was abnormal, and its westward extension beyond the shore line of the United States was one of the marked features of the pressure distribution of this and the preceding month. Consequently the month was abnormally warm and the rainfall largely from local thundershowers and thunderstorms in the Washington forecast district. No storm warnings were ordered for the Atlantic and east Gulf of Mexico coasts, and none were required. The weather on the Great Lakes was unusually quiet during the month and storm warnings were required on only one occasion. In that instance, severe squalls and strong south to west winds occurred.

In the West Indies and over the Gulf of Mexico, the northeast trade wind held sway, and there was at no time any indication of a tropical storm in these regions.

CHICAGO FORECAST DISTRICT.

No special warnings were issued from the Chicago district during the month of July. The month was abnormally warm throughout most of the district and usually free from disturbances other than local in character.—*E. H. Haines.*

NEW ORLEANS FORECAST DISTRICT.

The month was free from stormy weather, except for a few local thunderstorms. No warnings were issued or needed.

During the second week the rainfall was due largely to a weak depression which moved slowly westward near the Gulf coast from the 3d to the 10th. This depression, though slight and moving abnormally, was persistent, and the rainfall which set in after it reached

the middle Gulf coast continued after it had merged with the semipermanent depression in the arid Southwest. There were no other features worthy of special note.—*R. A. Dyke.*

DENVER FORECAST DISTRICT.

No important barometric areas crossed the district during the month, and no special warnings were issued except on the morning of the 3d, when low barometer readings prevailed in New Mexico and relatively high pressure in the Plateau region. Warnings of local frost were issued for Utah and northern Arizona. Frost temperatures, with clear skies, were reported in the valleys of northern Arizona on the morning of the 4th, but the barometer fell in northwestern Colorado and northern Utah and a rise in temperature occurred in Utah.—*Frederick W. Brist.*

SAN FRANCISCO FORECAST DISTRICT.

July was a quiet month in this district, no storms from the north Pacific passed far enough south to materially affect the weather. A few light storms of the Sonora type formed over the valley of the Colorado and thence moved east or northeast causing scattered light showers and thunderstorms in portions of the Plateau, the southern Sierra, and the mountain regions of southern California. The only one of these of importance, was that of the 20th, in the mountains back of San Diego, when heavy rain accompanied with high shifting winds caused a rapid rise in the small mountain streams and did some damage to crops. During this storm 2.90 inches of rain fell at Campo in less than an hour, and it was estimated that the rainfall was heavier in the higher mountains.

High temperatures were frequent throughout the interior but there was much cool weather and fog near the coast.

Fire-weather warnings were issued in northern California on the 1st and 2d.

Small-craft warnings were displayed from Eureka to Point Reyes on the 2d and 3d.—*G. H. Willson.*

RIVERS AND FLOODS.

627.41 (73)

By H. C. FRANKENFIELD, Meteorologist.

[Weather Bureau, Washington, Aug. 26, 1921.]

Atlantic drainage.—Heavy rains fell over the drainage basin of the Santee River during the late afternoon of July 17 and the night following, and on the morning of July 18 flood warnings were issued for the Santee, lower Wateree, and lower Congaree basins. The crest stage in the Santee River was slightly more than 1 foot above the average flood stage of 12 feet, although no damage was done. About \$10,000 worth of cattle and hogs were driven from the swamps before the floods occurred.

There was also a rapid rise in the Ocmulgee River about the same time which was covered by adequate warnings.

Mississippi drainage.—Rises were unimportant except in the Arkansas River from Wichita, Kans., westward and in the upper Canadian River. Warnings for the Arkansas River were first issued on July 21, and bank-full stages occurred generally between July 15 and 25.

Losses amounted to about \$3,500, and about \$2,000 worth of property in the State of Kansas was saved through the warnings.

Pacific drainage.—The annual rise of the Columbia River reached its close during the month of July, and the following report thereof was prepared by Mr. R. C. Mize, meteorologist, Portland, Oregon:

Reports at the close of March indicated that the amount of snow remaining in the higher mountains was above normal in eastern Oregon; slightly above normal in Idaho, northwestern Wyoming, and western Montana; about normal in British Columbia, and somewhat below normal in Washington. The snow was unusually compact, and the soil generally unfrozen and filled with water. At this time warning was given that, should a decided warm period occur in late May or in June, the river would rise considerably above the flood stage. This warning was generally heeded and little planting done below the 25-foot level except where the land was under dike.

The only great loss in any one section was due solely to the breaking of a portion of the dike in district No. 5 near Woodland, Wash., the